Amendment to the Specification

account in specifying the methods to be used in the melt circulation steelmaking loops for continuous steelmaking without disruptive ebullition and ejection of melt from bubbles as they burst through the flowing melt surface with consequential skull or accretion build-up on the walls and roof of the reactor, which would eventually necessitate shutdown of the continuous steelmaking plant. In the present invention, this is secured by adapting the processing conditions so that the supply of carbon to the melt surface by liquid phase mass transfer throughout all of the steelmaking loops is always adequate to prevent oxygen atoms from diffusing into the molten metal to such an extent that concentrations of both oxygen and carbon in the bulk molten iron reach supersaturation levels sufficient to induce the decarburisation reaction to occur spontaneously beneath the surface.

For the particular case of coal-based continuous steelmaking, two steelmaking loops are preferred. The first is top blown to effect primary decarburisation, whilst in the second loop what has been termed "open-channel" decarburisation is promoted under increased melt circulation rate. For both loops, steady-state conditions are established such that gas phase mass transfer, interfacial chemical kinetics and liquid phase mass transfer all balance each other.

BRIEF DESCRIPTION OF THE DRAWINGS

Particular examples of the invention as applied to direct coal-based continuous steelmaking will now be described with reference to the accompanying drawings in which:-

Fig. 1 is a schematic general arrangement in plan view of the plant for direct coal-based continuous steelmaking, when steel scrap, hot briquetted iron (HBI), or direct reduced iron (DRI) are readily available and their use is economical.

Fig. 2 is a schematic general arrangement in plan view for direct coal-based continuous steelmaking for a stand-alone plant based on virgin ore as the only source of iron units.

Referring now to Fig. 1, the plant comprises six furnace hearths 1, 2, 3, 4, 5 and 6, which are arranged in pairs to form three inter-linked melt circulation loops A (a charge

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